What is claimed is:

1. An electromagnetic field superimposed lens, having an electrical field bi-potential lens provided in a magnetic field lens, wherein

a magnetic pole of the magnetic field lens is divided into a first magnetic pole section at an earth potential, and a second magnetic pole section, facing a sample, to which a negative potential is applied, as well as to the sample, the two magnetic pole sections being electrically insulated from each other, and

the electric field bi-potential lens is made up of an electrode connected to the first magnetic pole section so as to surround an electron beam path, and the second magnetic pole section.

2. The electromagnetic field superimposed lens of claim 1, wherein the electromagnetic pole is formed by making one end of the first electromagnetic pole section and one end of the second magnetic pole section integral via an electrically insulating member.

3. The electromagnetic field superimposed lens of claim 2, wherein an excitation coil is attached to the first electromagnetic pole section, another end of the second magnetic pole section extends getting narrower towards the sample, to form a magnetic gap between the other end of the first magnetic pole section and the other end of the second magnetic pole section.

4. The electromagnetic field superimposed lens of claim 3, wherein the magnetic pole is opposite an end section on a sample side of the second magnetic pole section.

5. An electromagnetic field superimposed lens, having an electrical field bi-potential lens provided in a magnetic field lens, wherein

a magnetic pole of the magnetic field lens is divided into a first magnetic pole section at an earth potential, and a second magnetic pole section, facing a sample, to which a negative potential is applied, as well as to the sample, the two magnetic pole sections being electrically insulated from each other, and

the electrical field bi-potential lens is comprised of a high resistance body provided between the first magnetic pole section and the second magnetic pole section so as to surround an electron beam path, so as to apply a potential difference between the first magnetic pole section and the second magnetic pole section.

6. The electromagnetic field superimposed lens of claim 5, wherein the electromagnetic pole is formed by making one end of the first electromagnetic pole section and one end of the second magnetic pole section integral via an electrically insulating member.

7. The electromagnetic field superimposed lens of claim 6, wherein an excitation coil is attached to the first electromagnetic pole section, another end of the second magnetic pole section extends getting narrower towards the sample, to form a magnetic gap between the other end of the first magnetic pole section and the other end of the second magnetic pole section.

8. An electron beam device using the electromagnetic field superimposed lens of according to claim 1.